

*Original Research*

## Globalization and Income Inequality in Nigeria

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### Abstract

The main objective of this study was to empirically examine the influence of globalization on income inequality in Nigeria from 1986 to 2021. The income inequality was represented by the Gini coefficient while globalization was measured by key indices like foreign direct investment, remittances, and trade openness. With the use of the autoregressive distributed lag (ARDL) approach which was as a result of the stationary of our series at levels and first difference as reported by the Augmented Dickey-Fuller unit root test, the study observed that a long-run relationship exists amid inequality and measures of globalization. In the short-run, it was realized that foreign direct investment, remittances, trade openness, and urbanization aided in reducing income inequality in the short-run while inflation accelerated income inequality within the study period. In the long-run, the only measure of globalization that significantly reduce income inequality is remittances; while foreign direct investment significantly increased income inequality in the long-run. the paper concluded that it is not inevitable that measures of globalization have different influence on inequality of income and wealth depending on time.

**Keywords:** Inequality, Poverty, Globalization, International Trade, Gini Coefficient.

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## Introduction

Economic globalization is the term used to describe how interdependent the world's economies have become due to the expansion of cross-border commerce in goods and services. It is an unstoppable trend for global economic development at the turn of the millennium and symbolizes the massive growth and reciprocal connectivity of market borders. Increases in commerce (products and services), cross-border investment, and labour movement from one country to another have made countries, businesses, and individuals more interconnected and interdependent, which brings about "globalization".

In recent years, globalization, which economists defined as "the unrestricted flow of money, labour, technology, and goods across national borders", has taken on a new dimension. This is demonstrated by the outsourcing of jobs, the low level of financial integration, and the volume of international trade, the presence of multinational firms, the exchange of highly skilled workers, and the high level of technology. The disparity in income inequality between various globalized nations is the result of this. Income disparity can be defined as the gap in earnings between people living in the same country, between employees and property owners in the same country, or between the average incomes of different countries (nations) (Milanovic, 2005). Because the GATT (General Agreement on Tariffs and Trade) and WTO (World Trade Organization) frameworks have compelled many nations to gradually reduce their tariff and non-tariff barriers, an increasing number of nations are opening up their capital and current accounts. All of these have significantly boosted trade and investment growth through globalization (World Trade Organization (WTO), 1995). The economic process of globalization also refers to the process of industrial readjustment and restructuring on a worldwide scale. In recent years, many labour-intensive businesses with low international competitiveness have begun to migrate to developing countries from western industrialized countries as they increasingly embrace the era of the information economy (Shangquan, 2000).

Globalization affect developing countries through changes in commodity prices in global markets. For example, increase in food and energy prices across the globe is believed to be driven by the Russia-Ukraine wars. Globalization also affects wage income in some countries as a result of increase is that technological change and globalization created a global market for top executive talent and superstars (Atkinson, Piketty, & Saez, 2011), which increased the global demand and earnings for the most talented individuals. International trade is also believed to increase inequality because changes in inequality that occur if workers lose jobs in response to trade shocks and experience transitional unemployment (Milton, 1995).

Increasing specialization and trade are two ways that globalization worsen income inequality. Some of the earlier studies ignored the effect that globalization will have on jobs and income inequality globally. This is contrary to popular belief, because trade based on comparative advantage can increase relative poverty even though it has the ability to boost economic growth and per capita incomes. For instance, if a nation can import good at a lower cost from abroad, there is going to be reduction in domestic supply, employment, and real incomes in that industry, resulting in a reduction in real wage and an increase in income inequality. Although through increase in international trade, government increase its tax revenues to fund capital investment by providing public

goods and services and funding programmes which will improve the welfare of the citizens (Calderon & Chong, 2001; Rodriguez & Rodrik, 2001). Through comparative advantages, the introduction of cutting-edge technologies, capital inflows, the dismantling of monopolies, and the ensuing development of market competition, developing countries gain from globalization (Dollar & Kraay, 2001). Despite these advantages, the gap between industrialized and developing nations has grown rather than shrunk as a result of economic globalization (Shangquan, 2000).

Recently, 52% of global income goes to the richest 10% of people. the world's poorest 50 percent of people? Well, they only make 8%. An individual from the top 10% will typically make \$122,100, while someone from the bottom half will only make \$3,920. The disparity is much bigger when it comes to wealth (valued possessions and items over and beyond income). Just 2% of the world's total wealth is owned by the poorest 50% of people, while 76% of all wealth is held by the richest 10% (Myer, 2021). Also, the global inequality in 1990s stood at 66%, while in 2000, it stood at 63% (Bourguignon & Morrisson, 2002; Sutcliffe, 2003). It has further been pointed out that increase in profit by multinational corporations through globalization usually increases inequality. Most multinationals present in developing countries are involved in tax evasion, which can result in inability of the host country to generate enough tax revenue to meet her obligations such as paying for public services and welfare systems which will affect income distribution and increase inequality. Oxfam (2013) reports, estimates that tax avoidance costs developing countries \$160 billion a year whereas \$100 billion could provide an education for 124 million children and pay for healthcare services that could prevent the deaths of at least six million children annually.

One area where the effects of globalization have been hotly contested is economic inequality. Since it makes up the majority of global income inequality, income inequality between countries is significant. For the reason that poverty is essentially a distribution issue rather than a globalization issue, income disparity is crucial. In the majority of emerging nations, the effects of globalization outweigh those of decreased income inequality. Inequality has remained high in a significant number of developing economies even though the typical individual is far wealthier now and some countries have profited more from globalization than average people and countries in the past. The Nigerian government, like other developing countries, has since changed its trade policies to incorporate trade openness, like other emerging nations due to Bretton Woods's recommended Structural Adjustment Programme (SAP) (Central Bank of Nigeria (CBN), 2021; Lamoreaux & Shapiro, 2019; Dasgupta, 1997). Despite the high level of globalization, global inequality still remains very high with continuous absolute poverty. Around 2.1 billion people, or 35% of the world's population, were estimated to be living on less than \$3.10 per day in 2012. Low levels of nutrition, sanitation, and education are the results of such poverty, as are high rates of child labour and exploitation. Approximately 29,000 children each day pass away from primarily preventable causes, and wealth is not spread equitably (World Bank, 2012). Most studies have agreed on the size of inequality around the world (Milanovic, 2005; Sala-i-Martin, 2002; Bhalla, 2002). However, there is a controversy regarding the recent direction in which inequality has followed as a result of globalization. While Maku, Ogede, Adelowokan, & Oshinowo (2021) and Odo, Agbo & Agbaji (2020) argued that "globalization worsens Nigerian income inequality", Ifeakachukwu (2020) and Baek & Shi (2016) argued otherwise.

This study is interested in examining the impact of globalization on income inequality in Nigeria due to disputes in the literature over how it affects income disparity. Examining the effects of globalization on income inequality in Nigeria is the main goal of our study. The specific goals are to evaluate the combined effects of trade openness, FDI, remittances, exchange rates, and inflation on income inequality in Nigeria; and to outline the policy implications, taking the impact of globalization on income inequality into account.

## Literature Review

Globalization has been proved to have several advantages. Indeed, globalization has lifted hundreds of millions of people out of poverty. Since Samuelson's (1939) pioneering work on trade gains, several studies have confirmed that trade improves welfare compared to autarky due to productivity gains and a new variety of products. See (Arkolakis, Costinot, & Rodríguez-Clare, 2012; Costinot & Rodríguez-Clare, 2014) for empirical studies confirming that trade improves welfare compared to autarky; Bergh & Nilsson (2011) for empirical evidence on globalization). When globalization is accelerating, it is not certain that everyone in any country will benefit.

The Heckscher-Ohlin (HO) model is the traditional theoretical framework for examining the link between globalization and distributional market outcomes (Ohlin, 1933). It describes the globalization's inequality effect as "a result of productivity disparities and country's relative factor endowment, as well as the amount to which individuals rely on labour or capital income" (Dorn, Fuest, & Potrafke, 2021). When countries open up to trade, they concentrate in manufacturing in their relatively plentiful factor and export these items. Consistent with the Stolper-Samuelson theorem, "future trade-induced relative changes in product prices enhance the real return to the factors employed intensively in the manufacturing of the factor-abundant export items while decreasing the returns to the other factors" (Stolper & Samuelson, 1941).

As a result, the country's plentiful production factors benefit from openness, while scarce factors suffer. Most theories discriminate between labour and capital as production inputs, or between unskilled and skilled labour. For the reason that capital and trained labour are relatively abundant in industrialized countries, income inequality and concentration of income towards the top earnings are likely to rise (Dorn, Fuest, & Potrafke, 2018). Unskilled labour, which is heavily engaged in local manufacturing in developing nations, would profit from economic openness by rising salaries. Income disparity in industrialized nations is so anticipated to decline. Consistent with the HO-model assumptions, how globalization affects income disparity depends on a country's degree of development (Dorn, Fuest, & Potrafke, 2018).

Many research has highlighted to the shortcomings of the typical HO-model assumptions and explored other ways in which globalization may effect income inequality during the 1990s. Leamer (1998) established proof for the Stolper-Samuelson mechanism only in the 1970s, while there is absence of proof in other decades; Goldberg & Pavcnik (2007) demonstrated also poor performance of the model's predictions about the bond of trade and earnings in developing nations). The Heckscher-Ohlin model, for example, "is based on between-sector reallocations and ignores within-sector movements

in production and vertical specialisation between nations" (Dorn, Fuest, & Potrafke, 2018). While offshoring and outsourcing of low-skilled output within a sector reduces salaries and bargaining strength for low-skilled employees in advanced economies, offshored and outsourced activities along the value chain may be highly skill-intensive from the perspective of developing countries (Feenstra & Hanson, 1996; Feenstra & Hanson, 1999).

Along the same lines, Feenstra & Hanson (1997) argue that "FDI raises the relative demand for skilled labour and the skill premium in the developing world due to capital-skill complementarities". Furthermore, as a result of increased exposure to import competition, employment in the developing world's traded sectors may become more skill-intensive, resulting in lower relative salaries for low-skilled employees (Cragg & Epelbaum, 1996). Income inequality may also develop as a result of diverse enterprises within sectors and nations, as well as salary premia for workers in international trade firms. Exporting enterprises are more productive than non-exporting firms, and they pay higher wages to attract more qualified workers (Manasse & Turrini, 2001; Munch & Skaksen, 2008; Egger & Kreickemeier, 2009; Frias, Kaplan, & Verhoogen, 2012; Sampson, 2014).

Political and social globalization are also likely to have an impact on economic disparity (Dorn, Fuest, & Potrafke, 2018). Political globalization may lead to countries establishing shared basic standards, hence increasing equality within countries (Dreher, 2006). International migration can have a variety of consequences on income distribution in both the sending and receiving countries. Standard immigration models predict that "elements for which immigration is an effective substitute will lose compared to complementing ones. If immigration increases the labour supply of unskilled workers, the pay gap between high-skilled and low-skilled labour will widen, as will income inequality" (Borjas, Freeman, & Katz, 1997). Changing social norms as a consequence of increased engagement and integration throughout the world may also modify social acceptability of income disparity and hence affect people's behaviour, such as union wage negotiation (Atkinson, 1997).

In line with the "race-to-the-bottom" theory (e.g., Sinn (2003), "globalization exerts lower pressure on tax rates and regulations for movable elements such as capital tax rates". Furthermore, large welfare states attract unskilled and impoverished immigrants seeking to gain from redistribution. This results in lesser government spending and less redistribution. Thus, after taxes and transfers, globalization is predicted to worsen income inequality. Experts that emphasize the "bad side of globalization," such as Stiglitz (2002), argue that "globalization is to blame for reduced redistribution activities and dwindling social security systems" (Dorn, Fuest, & Potrafke, 2018).

The compensation theory (Rodrik, 1998), on the other hand, expects a growth of the welfare state, providing insurance against the mounting risks connected with globalization. One form of this argument is that "victims of globalization may seek restitution" (Dorn, Fuest, & Potrafke, 2018). Based on this theory, globalization will expand the size and reach of government. In a similar line, it has been argued that "when globalization increases market income inequality, policymakers that seek to maximize the sum of all agents' welfare would boost redistribution" (Gozgor & Ranjan, 2017). In

keeping with Meltzer & Richard (1981), “rising inequality tends to enhance redistribution since the median voter would prefer more redistribution”. The empirical evidence on the relationship between globalization and welfare states is mixed (Schulze & Ursprung, 1999; Ursprung, 2008; Kauder, 2015; Potrafke, 2015).

We review some of the relevant literature that concentrates on country-specific, regional, and cross-section analysis. Borjas & Ramey (1994) analyzed the causal impact of several explanatory factors on income inequality in the United States using cointegration methods. It was determined that the durable goods trade deficit as a percentage of GDP is the sole explanatory variable with a significant long-term trend to income inequality. The study demonstrates a positive association between inequality and globalization by using trade as a proxy for globalization.

Chakrabarti (2000) investigated the influence of intra-national income distribution and international trade. The study analyzed data from 73 nations in 1985, including low-income, lower middle-income, higher middle-income, and high-income countries. For estimate, the study used OLS and IV-GMM. The study's findings revealed that “increasing involvement in international trade and growth decreases income inequality”, providing a method via which international trade might reduce income unequal distribution.

From 1995 to 2001, Heshmati (2004) used two globalization indexes from 62 nations to study the relationship between income inequality and globalization. For estimate, the ordinary least squares approach was applied. In keeping with the findings, different aspects of globalization have varying effects on inequality. Technology helps to reduce income inequality, but economic liberalization increases inequality, and political participation has little influence on income inequality. Consistent with the study, “wealthy nations have a more equitable distribution of income than developing ones”.

Panel data from 1972 to 1994 in the US under the framework OLS was used by Silva & Leichenko (2004) to investigate the influence of international trade on income inequality. In relation to the study's findings, “costlier imports and cheaper exports are exacerbating the situation of economic inequality in various United Nations member nations. The study determined that inequality rose across and across states in the United States from 1992 to 1994.

Rudra (2004) looked into the link between government social spending, openness, and wealth distribution in developed and developing nations. Panel data from 35 less developed and eleven OECD nations were utilized from 1972 to 1996, with fixed effect and two stage least square estimation techniques applied. The findings revealed that “trade increased inequality only in LDCs and social expenditure decreased inequality only in OECD countries, although education spending also lowered inequality in LDCs”. Consistent with the study, wealthy nations' social spending and trade conditions are far superior than those of less developed ones.

With cross-sectional data from 95 nations in 1988 and 113 countries in 1993 for analysis using simultaneous decile and IV-GMM, Milanovic (2005) investigated the rapport between openness and income distribution in low-, middle-, and high-income

nations. In line with the study's findings, "trade increases inequality but financial depth decreases it". Foreign direct investment had little effect, and democracy increased economic inequality. The study showed that "the gains of international trade were mostly obtained by the wealthy, with the poor getting a lesser percentage of income in progressively interconnected countries".

Felbermayr (2005) reviewed the bond between openness of economies and per capita income by utilizing panel data, and the temporal dimension was a five-year average which was analyzed using a system-GMM method. The earliest period utilized was 1960 to 1964, and the latest period was 1995 to 1999 for 93 nations. The study discovered "a positive trade-income association but no evidence that trade decreases income inequality". As a result, the study found that the impact of free trade differs between poor and affluent nations.

From 1973 through 1997 with unbalanced panel data for 12 European nations, Beckfield (2006) looked at the connection between national income inequality and regional integration. The methodology used in the study included generalized least squares, fixed and random effects. Economic integration was shown to be positively connected to the GINI coefficient in all three estimating methodologies. According to the report, "more regional economic cooperation among European nations raises income inequality".

Ali & Isse (2007) looked at how foreign aid and trade liberalization affect income distribution by using panel data from 150 nations spanning the years 1975 to 2000. The study employed the simultaneous equations system and the three-stage least squares approach. In keeping with the findings, "there is a positive and substantial relationship between international trade and GDP per worker, but government spending and foreign direct investment have a negative impact on income". They determined that trade and foreign aid are strong predictors of GDP per capita, and that international trade appears to be beneficial to economic performance.

In Mozambique's developed southern and less developed northern regions, Silva (2007) investigated the influence of export and domestic agricultural trade on income inequality. The study employed OLS to analyze cross-sectional data from 1996 to 2000. Consistent with the study's findings, "domestic agricultural trade has a growing influence on inequality in southern Mozambique. Whereas international agricultural export has a moderating influence on inequality in northern Mozambique". As a result, the study determined that income inequality differs by geography and trade type.

Meschi & Vivarelli (2007) estimated the influence of trade on within-country income inequality in a sample of 70 developing countries (DCs) from 1980 to 1999 using a dynamic specification. In accordance with the findings, "overall aggregate trade flows are only marginally associated to income inequality". However, by breaking down overall trade flows by origin/destination, the study discovered that "trading with high-income nations worsens income inequality in developing countries, both through imports and exports". This study lends preliminary support to the concept that technical differences between trading partners play a major role in influencing trade openness's distributive impacts. Furthermore, when controlling for the differential impact of trade in middle-

income versus low-income DCs, it was discovered that the prior conclusion only applies to middle-income nations (MICs). This outcome is interpreted by taking into account “MICs’ larger technical upgrading potential, both in terms of their higher ‘absorptive capacity’ and their superior ability to serve the differentiated and high-quality markets of the developed world”.

Babones & Zhang (2008) examined the relationship between inequality and trade by categorizing nations into three income groups: core, semi-periphery, and periphery. The study employed a world-systems approach, with cross-sectional models calculated at five-year intervals: 1980, 1985, 1990, 1995, and 2000. The results for semi-periphery nations revealed that trade is associated with reduced income inequality, but trade is associated with increased income inequality in core and peripheral countries. As a result, the study indicates that “trade affects income inequality in zone-specific ways”.

For the economy of China, Tian, Wang & Dayanandan (2008) evaluated the influence of economic globalization on income inequality through FDI and international trade. The ADF unit-root test and the Johansen and Juselius multivariate cointegration technique were used to analyze yearly data from 1979 to 2006. The findings revealed that “trade, FDI, and government expenditure all have the potential to improve wealth distribution”. They determined that income inequality in China is caused by variables other than trade liberalization.

To Atkinson, Piketty, & Saez (2011), the reduction in inequality witnessed by most nations following WWII may be linked to a decline in the capital share of income caused by the Great Depression and conflicts through physical damage, hyperinflation, and bankruptcy, among other factors. The decline in inequality is considerably more pronounced for the top 1% since their incomes are more strongly concentrated in capital sources. Interestingly, the percentage of the top 4% or top 9% did not fall as much since these groups rely more largely on labour income, which was unaffected by the aforementioned shocks. Inequality did not recover after the Second World War. The authors explain this stall in inequality to the implementation of progressive taxation and estate taxes, which prevented capital income from being recovered in numerous developed nations (Pavcnik, 2011).

Bergh & Nilsson (2011) used GMM to investigate the relationship between globalization and within-country income inequality. They included various control variables and controlled for potential endogeneity. They observed that “economic freedom changes appear to enhance inequality mostly in the North, whereas social globalization is more relevant in the South”. It has also been discovered that monetary, legal, and political globalization do not promote inequality.

With the aid of data from 1990 to 2009 in Hungary and the OLS method of analysis, Georgantopoulos & Tsamis (2011) investigated how globalization affected income distribution. Consistent with the study's findings, “boosting trade and foreign capital penetration improves income distribution, whereas remittances have a favourable influence”. The study stated that the outcome of the analysis support common knowledge that “opening up countries to foreign trade reduces income disparity and that the globalization process benefits Hungary”.

Lu & Cai (2011) investigated the link between trade openness, factor endowment, and individual income distribution. The study estimated panel data from twenty-four Chinese provinces from 1997 to 2005 using a random and fixed effect approach. They discovered that “income distribution is more equitable in land and capital-intensive provinces, but less so in human capital and labour-intensive provinces”. The study maintained that China's total trade openness adds to rising income inequality.

With sample of 41 nations for the years 1970, 1980, and 1990 which were analysed by employing a reasonably generic model and many robustness tests, Bensidoun, Jean, & Sztulman (2011) re-examined the link between income distribution and international trade by taking each country's trading pattern into account. The study's findings revealed that “changes in the form of trade had a considerable influence on income distribution, with the amount depending on the country's national income level”. Consistent with the report, international trade considerably contributes to rising income disparities in emerging nations.

Cassette, Fleury, & Petit (2012) differentiated between the short and long run effects of international trade in commodities and services on income inequality. The study employed yearly panel data for ten advanced nations from 1980 to 2005, using panel cointegration, an error correction technique, and dynamic ordinary least square estimation. As stated by the study's findings, “trade in services has only a short run influence on income inequality, but trade in products has both a short and long term impact”. Accordingly, total international trade causes a rise in income inequality.

For 68 developing countries' panel data from 1990 to 2010, Atif *et al.* (2012) examined the influence of globalization on income inequality by estimating static and dynamic models. The findings are consistent expectation, and it is claimed that “more globalisation in poor nations leads to an increase in income inequality”. The report portrayed that the influence of globalization on income distribution differs each country, depending on the structures and institutions in existence.

Rodriguez-Pose (2012) studied the relationship between trade openness and intra-country inequality. The study examined unbalanced panel data for 28 nations from 1975 to 2005, employing both static (OLS) and dynamic (GMM) panel data methodologies. In relation to the findings, “an increase in international openness has a good influence on regional inequality”. However, the analysis indicated that changes in trade agreements have a greater impact on income inequality in medium and low income nations than in high income countries.

Using unbalanced panel data from 55 DCs which analyzed via IV-GMM and 2SLS, Demir, Ju, & Zhou (2012) investigated the relationship between trade structure, sectoral employment, and income inequality in developing economies. The study's findings indicate that “trade structure and employment are considerably positive, implying that an increase in the percentage of manufactured exports and industrial employment increases income disparity”. In view of that, differing trade structures considerably exacerbate income disparity.

In the case of data from 51 economies, 20 of which are advanced and 31 of which are developing and emerging economies, from 1981 to 2003, Jaumotte, Lall, & Papageorgiou (2013) investigated the impact of trade, technology, and financial globalization on income inequality. For estimate, the researchers utilized OLS with heteroskedasticity-consistent standard errors and instrumental variable least squares. With reference to the findings, “more trade tends to lessen income disparity, but technical and financial globalization tends to worsen it”. As a result, the study indicated that different mechanisms of globalization had varying effects on income inequality.

In the case of the Nigerian economy from 1986 through 2010, Ogunyomi, Daisi, & Oluwashikemi (2013) investigated the influence of economic globalization and growth on income inequality. The static linear model and structural simultaneous equation model were used in the investigation. The findings revealed that “trade had a negative influence on income inequality, however financial globalization has a large favourable impact”. On account of the emphasis on financial globalization, it was established that economic globalization tends to exacerbate income disparity and limit economic growth in the Nigerian economy.

In Pakistan through the use of data from 1972 to 2008 which were analysed using cointegration and vector error correction techniques, Munir *et al.* (2013) examined the relationship between trade openness and income inequality. In line with the findings, “trade, remittances, interest rates, and urbanization all raise inequalities, but FDI decreases them”. The study affirmed that following liberalization, income disparity increased in Pakistan's economy.

Lee (Lee, 2014) investigated how international and financial integration affects poverty and income inequality using the OLD technique. The study collected data from 1976 to 2004 for the income inequality model and 1990 to 2004 for the poverty model. The study's findings revealed “a conditional relationship between international trade, income disparity, and poverty, whereas financial integration worsens poverty and income inequality in general”.

Hepenstrick & Tarasov (2015) studied how trade openness differences lead to cross-country income disparities. The model was calibrated for the year 2003 for 86 nations using OLS and the Poisson pseudo maximum likelihood (PPML) estimate method. The study discovered that “if the nations are fully symmetric, there will be no trade openness inequality. However, in a world where nations differ in endowment, population size, and changeable trade costs, income inequality would rise as a result of trade”.

In Asian nations, Bukhari & Munir (2016) investigated the impact of trade, financial, and technical globalization on income inequality using pooled OLS and the instrumental variable least square approach. The study employed panel data from 1980 to 2014 for selected Asian nations for the trade and technology globalization models, and 1990 to 2014 for the financial globalization model. The findings reveal that “trade and technological globalization considerably reduce income inequality in the chosen Asian nations, but financial globalization increases income disparity”. While education has a negative influence on income disparity, FDI has a direct impact on income inequality.

Dorn, Fuest & Potrafke (2018) used an IV-GMM method to cope with the endogeneity of globalization measures to re-examine the connection between globalization and income inequality for 140 countries from 1970 to 2014. The findings demonstrated that the relationship between globalization and income inequality varies between nations. Globalization and inequality have a strong positive association in transition nations such as China and the majority of Middle and Eastern European countries. Neither OLS nor 2SLS results demonstrated a significant positive link between globalization and inequality in the sample of the most advanced economies. It was determined that “income insurance and education institutions, which define most advanced economies but are less established in transition economies, may have reduced the impacts of globalization on income disparity”.

Ebele, Nnenna, & Nkechinyere (2019) investigated the impact of globalization on oil-rich Nigeria using quarterly time-series data on an empirical model that is based on the Stolper-Samuelson theorem, the Johnson cointegration test, and error correction model. The study's conclusions showed that while productivity significantly reduced income inequality in Nigeria over time, globalization, technology, and foreign direct investment significantly increased it. In order for Nigeria to benefit from globalization, the study suggested encouraging domestic entrepreneurship through strategies for export promotion and import substitution.

Data from 158 economies for the years 2006 to 2014 were used to create a new composite globalization index, which Hyeon-Seung & Cyn-Young (2019) used to empirically assess the potential impacts of globalization on economic growth and income inequality. The findings demonstrate that, despite encouraging economic growth, globalization may worsen income inequality. High-income countries benefit the most from globalization because it has a stronger positive impact on their economies than it does for other income groups, and because the gap between rich and poor is not as wide in these countries.

The study on “Globalisation, Economic Growth and Income Inequality in Nigeria” was explored by Nwosa (2020) using that which spans through 1981–2018. With the utilization of VECM and ARDL approaches, inequality and globalization are unidirectionally related to economic growth in the long run, according to the VECM results, whereas inequality and economic growth are uni-directionally related in the short term. For the ARDL estimate, economic growth and globalization are important factors influencing inequality in Nigeria. Furthermore, it has been found that the effects of global trade and financial integration on income inequality were different.

Osode, Iheonu & Dauda (2020) looked at the connection concerning globalization and income inequality in addition to the effects of institutional quality on income inequality and the link between globalization and income inequality. The study used instrumental variable quantile regression to take simultaneity and reverse causality into account. It was discovered that “trade globalization significantly increases income inequality in countries where the initial levels of income inequality are high, while it decreases income inequality in countries where the initial levels of income inequality are low in the presence of improved institutions”. Additionally, in countries with high and low initial levels of income inequality, respectively, foreign direct investment and official development

assistance significantly increase income inequality in the presence of improved institutional quality.

In Bangladesh, Uddin (2020) investigated the impact of globalization on income inequality in Bangladesh between 1975 and 2018 using OLS and cointegration analysis. According to study findings, Bangladesh's income inequality is significantly affected over the long term by globalization variables such as exports, imports, foreign aid, foreign direct investment (FDI), and remittance inflows. During the study period, Bangladesh's income distribution is being negatively impacted by exports, FDI, and remittance inflows while long-term foreign aid and imports are improving.

It is clear from the above review that the exact effect of globalization on income inequality is not unique across nations and regions of the world. This is evidenced from the mixed findings on the literature so reviewed. This lack of consensus creates a gap in the literature which this study intends to fill. This study utilizes recent data and the ARDL framework to explore both the short-run and long-run effect of globalization on income inequality with specific interest in Nigeria.

## Methodology

### *Research Design*

Utilizing secondary data from the statistical bulletin of the Central Bank of Nigeria from 1986 to 2021, this analysis will be quantitative in nature. The 5% threshold of significance will be used for the hypothesis test. The Autoregressive Distributive Lag method will be used in economic analysis to look at how globalization has affected income inequality in Nigeria (ARDL). We will use a single multiple regression model to examine how globalization has affected income inequality in Nigeria.

### *Model Specification*

Based on the International Trade Theory (Haberler, 1961) and the work of Hussain, Chaudhry and Hassan (2009) the model that this study will adopt is specified as follows:

$$gini = f(fdi, rem, inf, top, urgr) \quad (1)$$

The econometric version of the model is stated as follows:

$$gini = \beta_0 + \beta_1 fdi + \beta_2 rem + \beta_3 inf + \beta_4 top + \beta_5 urgr \quad (2)$$

Where:

*gini* = the GINI coefficient used as a proxy for income inequality

*fdi* = foreign direct investment

*rem* = Remittances

*inf* = Inflation Rate

*top* = Trade Openness (proxy for Export + Import as a ratio of GDP)

*urgr* = urbanization Growth Rate (proportion of the population in the urban area)

$\beta_0$  is the constant term;  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$ ,  $\beta_4$ , and  $\beta_5$  are the coefficients of the independent variables; and  $\mu$  is the error term

### *A priori Expectation*

The a priori expectation for our specific model is stated below:

$\beta_1, \beta_2, \beta_3 > 0$ ;  $\beta_4, \beta_5, \beta_6 < 0$ .

### *Data Collection and Sources*

The study will assess secondary data from the CBN statistical bulletin, Nigeria Bureau of Statistical (NBS) bulletins, World Bank database on World Development Indicators, and annual reports from 1986 – 2021.

### *Method of Analysis*

The study will use the subsequent data analysis techniques. To check for stationary, an Augmented Dickey-Fuller (ADF) - Unit Root-test will be used first. Second, the Autoregressive Distributed Lag (ARDL) test will be used to evaluate the impact of the independent factors on the dependent variables over the long and short terms. The following methods are discussed:

### *Unit Root Test*

The unit root test is conducted to ascertain the order of integration of the time series variables employed in the study. In this regards, the study utilized the augmented Dickey-Fuller (ADF) unit root test. The test follows the constant and trend assumption, which the test equation in its general form is specified as follows:

$$\Delta m_t = \varphi + \delta t + \beta_1 m_{t-1} + \sum_{i=1}^q \rho_i \Delta m_{t-i} + \varepsilon_t \quad (3)$$

As can be observed from Equation (3),  $m_t$  is the time series variables to be tested for unit root (in this case we have a vector of GINI, TOP, FDI, REM, EXR, CRD, and URB);  $q$  captures the lag length;  $t$  measures the time trend,  $\varphi$  is the constant (drift);  $\beta_1$  is the parameter to be subjected to the test where the null hypothesis is stated as  $\beta_1 = 1$ ;  $\Delta$  is the difference operator; and the summation component of the model captures the augmented aspect of the model where its importance is to correct for any form of serial correlation. The decision rule follows the 5% level of significance where the ADF statistic must be more negative than the 5% critical value for the null hypothesis of unit root to be rejected.

## Test for Cointegration

Since our study utilizes the autoregressive distributed lag (ARDL) approach of estimation, the test for cointegration follows the bounds testing approach. This approach is appropriate when the variables are integrated in mixture of levels, I(0), and first difference, I(1). The test facilitates the detection of the presence of long-run relationship among variables of interest given that they are not all integrated at levels.

## Error Correction Model

For an examination of the short-run dynamics and long-run levels estimates, the ARDL error correction model offers a potent framework within such can be executed. The model estimation brings forth both the short-run and long-run estimates and also present how fast the model adjust from the short-run for equilibrium to be achieved in the long run. The model is specified thus;

$$\Delta GINI_t = \theta + \sum_{i=1}^p \varphi_i \Delta GINI_{t-i} + \sum_{i=0}^q \rho_i \Delta X_{t-i} + \delta ECM_{t-1} + \epsilon_t \quad (4)$$

Where the variables are as earlier defined and  $X$  is a vector of the explanatory variables given as:  $X_t = [TOP_t, FDI_t, REM_t, EXR_t, CRD_t, URB_t]$ .

In Equation (4),  $n$  is the optimal lag length of the dependent variables while  $q$  captures that of the explanatory variables. The parameters  $\varphi_i$  and  $\rho_i$  represents the short-run parameters,  $\delta$  denotes the speed of adjustment of the short-run disequilibrium to long-run equilibrium, and  $ECM$  is the error correction mechanism expressed as the one-period lag of the residual. It must be noted that for any error correction to take place,  $\delta$  must be negative and statistically significant at the 5% level.

## Data Analysis, Interpretation of Results and Discussion of Findings

### Stationary Test

Table 1. Augmented Dickey-Fuller (ADF) Unit Root Test Result

Variables	Augmented Dickey-Fuller Test Statistic	5% Mackinnon Critical Level	Order of Co-integration
gini	-5.9984	-2.9540	I(1)
fdi	-3.9574	-2.9484	I(0)
rem	-6.0568	-2.9511	I(1)
top	-3.3704	-2.9484	I(0)
upgr	-3.7227	-2.9862	I(1)
inf	-3.4614	-2.9511	I(0)

According to the unit root finding in Table 1, three of the seven variables utilized in this study are stationary at the first level (I(1)), while the other three are stationary at the level (I) (0). Gini, Upgr, and Rem are the variables that are stationary at the first level,

while fdi, Top, and Inf are the three variables that are stationary at the level. The paper then moves on to utilize the Autoregressive Distributive Lag (ARDL) in other analyses in light of the findings from the stationary tests.

### *ARDL Estimation for Long Run Coefficients*

At this stage of the ARDL modeling for the univariate co-integration test, estimates of the model's long-run coefficients are generated. The Schwarz Bayesian Criterion and the Akaike Information Criterion define the ideal delays for the ARDL model. The estimated long run coefficients for the presented model, calculated using both the criteria and the ARDL (3, 4, 3, 1, 4, 4) specifications, are shown in Tables 2 and 3.

Table 2. F-Bounds Test Result

Null Hypothesis: No levels relationship				
Test Statistic	Value	Significance	I(0)	I(1)
Finite Sample: n=35				
Actual Sample Size	32			
F-statistic	5.2296	10%	2.331	3.417
K	5	5%	2.804	4.013
		1%	3.9	5.419

Table 3. ARDL Long Run Form and Bounds Test Result

Dependent Variable: DLOG(RGDP)				
Selected Model: ARDL(3, 4, 3, 1, 4, 4)				
Variable	Coefficient	Standard Error	t-Statistic	Probability
FDI	12.7943	4.2105	3.0386	0.0189
INF	-0.8182	0.2585	-3.1653	0.0158
REM	-1.9740	0.5816	-3.3941	0.0115
TOP	-0.4725	0.3383	-1.3964	0.2053
UPGR	-5.5566	4.1166	-1.3498	0.2191
C	87.0049	27.1803	3.2010	0.0150

The variables utilized in this study are co-integrated, as evidenced by the F test statistics of 5.2296 with the upper critical at 5% (2.804). This suggests that the independent variables and the dependent variable have a long-term relationship.

The association between foreign direct investments (fdi), inflation rate (inf), and remittance (rem) is statistically significant, but trade openness (top) and urbanization growth rate (upgr) are statistically insignificant, according to the ARDL predicted values for the long-run coefficients. The associations between the variables demonstrate that inflation and remittances have an inverse connection with inequality (gini), and that a 1% rise in either will reduce income inequality by 0.8182 percent and 1.974 percent, respectively. However, there is a direct correlation between foreign direct investments and inequality, which suggests that for every unit increase in foreign direct investments, income disparity will rise by 12.79%.

Due to the presence of the long-run relationships among the variables, we proceed further to the parsimonious error correction model (ECM) that presents the short-run results.

### *Parsimonious Error Correction Model*

The parsimonious error correction result is presented in Table 4.

Table 4. Error Correction Model Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GINI(-1))	0.3545	0.1179	3.0067	0.0198
D(FDI(-1))	-9.4770	1.2937	-7.3251	0.0002
D(INF(-1))	0.5288	0.0856	6.1755	0.0005
D(REM)	-1.0342	0.4357	-2.3733	0.0494
D(TOP)	-0.1736	0.0586	-2.9619	0.0210
D(UPGR)	-6.5065	2.5393	-2.5622	0.0374
ECM (-1)*	-1.1487	0.1393	-8.2452	0.0001
R-squared		0.876781		
Adjusted R-squared		0.706170		

### *Interpretation of Results and Discussion of Findings*

The comparison of the long-run and short-run equations quantifies how quickly the economy adjusts to changes in sectorial variables. The difference between the short run and the long run is demonstrated by the error correction mechanism (ECM) coefficient, which has an absolute value of 115% (1.148749). The 115% shows that each period's rate of adjustment is moving very quickly. The residual coefficient shows that the economy's disequilibrium between long-run and short-run growth is adjusted within a year. The co-integration of the variables is demonstrated by the fact that the parsimonious result for the error correction term ECM(-1) is negative and significant. The dynamic model's output reveals that 87.6781% of the income inequality is described by the equation's variables, accounting for 0.876781 of the total coefficient of determination ( $R^2$ ), while the remaining 12.3219% is accounted for by the error term. The outcome demonstrates the short-term utility of all the variables taken into account in this investigation.

The short-run results show that the coefficient of foreign direct investment is statistically significant with a negative relationship to income inequality. This implies that increasing foreign direct investments by one unit in the short-run will result in reducing income inequality by 9.48%. This result supports the findings of Rezk, Amer, and Fathi (2022). This relationship is due to the impact that an increase in the inflow of FDI will have on job creation for the unemployed, income increase for the already employed, and the provision of skills and technology, thereby reducing income inequality. As Le *et al.* (2021) observed, by educating workers and enhancing their abilities, income disparity will be decreased.

The result further shows that remittance is statistically significant and inversely related to income inequality. This indicates that a 1% increase in remittances will lead to a

1.0342% reduction in income inequality. This result supports the works of Ofori *et al.* (2022). The continuous remittance by family members from abroad to their aged and poor family members for consumption and social events, which is sometimes saved as retainer income for these family members, is evidenced in the reduction of income inequality as shown in the result. Remittances, according to Kindleberger (1965), can give impoverished and financially excluded households a way to handle their liquidity issues. This can help to foster entrepreneurship, innovation, and the development of new jobs, which in turn provides a solid foundation for reducing income inequality.

An increase in the inflation rate by 1% will increase income inequality by 0.5289%. This is evidence from the short run, when inflation is high. This is because the relationship between the two variables is positive and significant. Increased income inequality is caused by a decrease in the purchasing power or take-home pay of low-wage workers, the unemployed, and the vulnerable as the inflation rate rises. This agrees with Nantob (2015) and Muhibullah & Das (2019).

Still, from the short-run result, trade openness is statistically significant with a negative relationship to income inequality. This suggests that when trade openness is increased by a unit, it will lead to a reduction in income inequality of 0.1736%. This finding agreed with Dorn, Fuest, and Potrafke (2021) who agreed that trade openness reduces income inequality in developing and emerging economies. This relationship is due to the effect that trade openness has on the labour market through the provision of jobs and other sources of revenue for those with no skills or formal education (Gourdon, Maystre, & Melo, 2008).

The urbanization growth rate is negatively related to income inequality in Nigeria. This finding implies that when urbanization is increased by 1%, income inequality will be reduced by 6.5066%. This finding agrees with Ha, Le & Trung-Kien (2019). This reduction might be all a result of some characteristics of urbanization, such as the presence of industries that create job opportunities, the availability of basic infrastructures that support small and medium-scale enterprises (SMEs), and the presence of large markets for products. Gotham (2012) opined that urbanization is influenced by a number of factors, including population growth brought on by migration and natural causes, as well as economic, social, and technological advancements that encourage movement to urban regions. Government policies and market regulations support urbanization. The management of natural resources, land usage, health, and people's livelihoods are all impacted by urbanization.

## Conclusion

The issue of globalization as it affects income inequality has been on the debate by scholars all over the globe. It has been noted by Kilic (2015) that even though globalization generates opportunities for some country's economic growth, it also triggers off poverty, inequality, and negative economic growth for others (Atan & Effiong, 2020). In the Nigerian case, our study is geared towards empirically ascertaining the influence of globalization on income inequality from 1986 to 2021. The income inequality was measured by the Gini coefficient while globalization was measured by key variables like foreign direct investment, remittances, inflation rate, and trade openness. The study

utilized the augmented Dickey-Fuller (ADF) approach for stationarity test; the ARDL Bounds test for cointegration, and ARDL Error Correction Model to explore both the short-run dynamics and the long-run stable relationship.

The ADF unit root revealed that foreign direct investment, trade openness, and inflation rate were stationary at levels; while Gini coefficient, remittances, and urbanization were stationary upon first differencing. For the fact that the variables are I(0) and I(1) does not require the use of the traditional Engel-Granger test for cointegration thus, the need to utilize the ARDL Bounds testing approach to cointegration (levels relationship). Findings from the Bounds test revealed that the F-statistic was outside the lower and upper bounds 5% critical values, thereby prompting the rejection of the null hypothesis of “no levels relationship”. Accordingly, cointegration exists.

The presence of cointegration is an indication that we need to estimate both the short-run and long-run estimates of our model. This was done using the ARDL error correction model (ECM) approach. The long-run result indicated that remittances, inflation, trade openness, and urbanization put forth a negative influence on income inequality while foreign direct investment wielded a positive effect. While the long-run effect of foreign direct investment inflation and remittances were significant; that of trade openness and urbanization were insignificant. Consequently, it can be concluded that foreign direct investment increased the level of income inequality significantly in Nigeria while inflation and remittances helps to reduce income inequality all in the long-run.

In the short-run, the model exhibits a high degree of endogeneity as the one-period lag of inequality put forth a positive and significant effect on the changes in income inequality. The implication here is that the previous level of income inequality determines what the present day level of income inequality will be. Consequently, if the income inequality in the last year was high, then the income in the next year will also be high if appropriate measures are not taken. It is worthy to note that foreign direct investment only has the ability to significantly reduce income inequality only in the short-run. this is obtained from the fact that the variable put forth a negative and significant short-run influence on income inequality. Thus, as foreign direct investment increases, income inequality decreases in the short-run. Inflation is also seen to be a short-run driver of income inequality in Nigeria as the variable wielded a positive and significant influence on income inequality. As inflation increases, income inequality increases which points to the deleterious effect of inflation on wealth distribution. Remittances still maintain its potency in reducing income inequality given its negative and significant short-run influence on the income inequality thus, as remittances increases, income inequality decreases and vice versa. The influence of trade openness and urbanization are seen to be critical variables for curbing income inequality in Nigeria as they both put forth a negative and significant influence on income inequality. Thus, rising trade openness and rising urbanization will aid in reducing the level of income inequality substantially.

Given these findings, the paper concluded that for the Nigerian economy to experience a declining trend in income inequality, the short-run variables that are potent are foreign direct investment, remittances, trade openness, and urbanization. This does not remain so in the long-run as only inflation and remittances serves as the potent variables that could aid in the reduction of income inequality in Nigeria. Therefore, it is not inevitable that

measures of globalisation have different influence on inequality of income and wealth depending on time. What matters is how governments approach the task of enhancing knowledge and skill access and ensuring that the advantages of international trade and investment generate sufficient tax revenues to provide high-quality and reasonably priced public services. By doing this, more benefits of globalization can be transformed into "public goods" as opposed to "public bads". The government should lower trade barriers and give subsidies to promote trade volume and minimize income disparity. There is need to invest in research and development efforts to improve technology globalization and to construct institutions that train low-skilled employees, which would help to reduce economic disparity.

### Authors' Contributions

Idongesit Edem Udoh conceptualized the idea behind the research and wrote the introduction. He also conducted the data analysis and interpreted the results. He was further involved in the reading and approval of the final copy of the manuscript.

Ubong Edem Effiong prepared the literature review and methodology of the research, and also read and approved the final clean copy of the manuscript. Further, he was involved in the formatting of the references and the manuscript to fit the guide for authors as prescribed by the journal.

John Polycarp Ekpe was involved in gathering the required data and arranging them in a form amenable for analysis. He also wrote the conclusion aspect of the paper, and was involved in the reading and approval of the final copy of the manuscript.

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